ENVIRONMENTAL AUDIT OF THE EAST BAYFRONT AND PORT INDUSTRIAL AREA

PROPOSED RESEARCH PROGRAM - PHASE 2
AUGUST 20 1990

BACKGROUND

The East Bayfront and Port Industrial Area was designated by the Province of Ontario on October 17 1989 as being of Provincial Interest under the Planning Act. This was done to protect the integrity of of the Royal Commission's studies and to ensure that development that might foreclose future options does not occur during the period of study and related decision-making.

An environmental audit of the designated area is being undertaken by the Royal Commission at the request of the governments of Canada and Ontario. Its purpose is to provide an objective analysis of the environmental conditions in the area in order to provide a firm basis for future land use and management decisions.

During Phase 1 of the Environmental Audit of the East Bayfront and Port Industrial Area, an attempt was made to review all existing sources of information about the terrestrial, aquatic and atmospheric environments of the area. Due to the lack of participation during Phase 1 by the City of Toronto and the Toronto Harbour Commissioners, some information was not available to the Environmental Audit workgroups during this time period. Both the City of Toronto and the THC are participating in the Audit during Phase 2.

The Phase 1 review of existing, accessible information revealed a number of gaps in our knowledge about the environment of the study area. In addition, submissions to the Commissioner during the public hearings on Environment and Health during May 1990 provided valuable feedback on Phase 1 and suggested some directions for Phase 2.

This draft proposal summarises the gaps in our information base and provides recommendations for Phase 2 research programs. Some of the suggested research will be undertaken by the Royal Commission as Phase 2 of the Environmental Audit. Other research may be undertaken as part of existing or potential programs of other agencies (eg the Metro Toronto Remedial Action Plan, the Clean Air Program and others). Since some of these programs may have a longer timeframe than the Environmental Audit, it is necessary to recognise that certain aspects of the research may not be complete by the end of Phase 2.

ECOSYSTEM APPROACH

The purposes of applying an ecosystem approach to the East Bayfront/Port Industrial Area are:

- to develop an understanding of the <u>whole</u> ecosystem (air, land, water, living organisms including humans, and the interactions among them);
- to provide an information base for the restoration of the integrity and health of the ecosystem.

During Phase 1 of the Environmental Audit, the study area was investigated by separating the environment into five components: air, water, land, built heritage and natural heritage. A number of existing and potential linkages among processes and elements of the ecosystem were revealed. For example:

- much of the degradation of air and water is contributed by sources outside the study area;
- air quality problems (eg odours and suspended particulates) originating in the port industrial area affect nearby communities (eg South Riverdale);
- pollutants may be transferred from soils to buildings, affecting indoor air quality, and to ambient air in windblown dust and soil;
- airborne contaminants (eg lead and salt from roadways) may be transferred to soils;
- pollutants may migrate from groundwater to the surface waters of Lake Ontario;
- food-chain contamination may result in accumulation of toxics in wildlife;
- spatial linkages among open spaces/wildlife habitats (eg Cherry Beach, Leslie Street Spit, Toronto Islands and the Don Valley) are presently weakly developed.

During Phase 2 of the environmental audit, these and other ecosystem relationships will be explored further, in an attempt to address such questions as:

- what are the implications of the environmental conditions in the area for human health, behaviour, activities and access ?
- how are human activities in and outside the study area affecting other elements of the ecosystem (air, land, water and wildlife) ?
- what relationships exist between the environment of the study area and downtown Toronto, the Greater Toronto Area, the Great Lakes Basin etc.?
- are contaminants being transferred among the soils, groundwater, surface waters and air, and if so what is the relative importance of such transfers ?
- what species or parameters might provide useful indicators of ecosystem health ?
- what measures are necessary to re-establish ecosystem integrity and to protect and restore beneficial uses ?

There are some key characteristics of an ecosystem approach that will be applied to all aspects of the Phase 2 research program. An ecosystem approach:

- takes in the whole system, not just parts of it;
- focusses on inter-relationships among the elements - "everything is connected to everything else";
- understands that humans are part of nature, not separate from it;

- recognises the dynamic nature of the ecosystem - a moving picture rather than a still photograph;
- incorporates the concepts of carrying capacity and resilience - suggesting that there are limits to human activity;
- uses a broad definition of the environment - natural, physical, economic, social and cultural;
- encompasses both urban and rural activities;
- is based on natural geographic units, such as watersheds, rather than political boundaries;
- embraces all scales of influence as appropriate (local, regional, national and international);
- strives for equity among species and generations;
- is based on a new ethic which measures progress based on quality, well-being, integrity and dignity in natural, social and economic systems.

PROJECT STRUCTURE

The environmental audit is being directed by a Steering Committee composed of representatives from the federal, provincial and municipal governments and the Metropolitan Toronto and Region Conservation Authority, as well as independent environmental experts and community representatives.

As in Phase 1 of the audit, the research for Phase 2 will be conducted by a number of workgroups focussing on specific topics (see below). The composition and functions of the workgroups will vary depending on the needs for each program. They will include consultants, government staff, and representatives of community/environmental groups.

PROGRAM OPTIONS

Within the broad framework of an ecosystem approach, eight program options have been identified:

1. Quality of Life/Health.
2. Hazardous Materials.
3. Assessment of Built Heritage.
4. Soils and Groundwater.
5. Natural Heritage.
6. Water and Sediments.
7. Air.
8. Stewardship and Accountability.

The following summaries for each program describe specific gaps in our information base, related recommendations for research and the present composition of the workgroups. Further details are available in the work plan for each program.

1. Quality of Life/Health

The environmental review undertaken during Phase 1, as well as submissions to the Environment and Health hearings, raised a number of questions about the quality of the environment for people using the area for work or recreation. Parts of the East Bayfront/Port Industrial Area create quite different experiences for people. On one hand, the open spaces adjacent to the Lake offer views, cool summer breezes and opportunities to see wildlife. Cherry Beach still provides good swimming opportunities throughout most of the summer. On the other hand, much of the industrial area is perceived as noisy, barren, smelly and dusty: not a place to enjoy being outside. Health risks from environmental conditions are a serious concern, both for people in the study area and those living in nearby neighbourhoods.

During Phase 1, little information was gathered about the possible impacts of the environment on human health. A better understanding of the implications of air pollution, soil contamination, water quality impairments etc would be useful in assessing the suitability of the area for future uses, determining appropriate methods and levels of environmental remediation, and understanding the effects on nearby neighbourhoods.

Useful contacts/programs include the Healthy Cities project of the City of Toronto; the environmental baseline study for S. Riverdale to be undertaken by the City of Toronto; occupational health and safety committees of individual industries; SETIAO; Metro's Social Development Strategy poll; local environmental groups; and residents' associations.

Research Options: Recognising that "quality of life" can encompass many parameters, the environmental audit investigation of this topic will address the following questions:

- What are the characteristics/indicators of a healthy ecosystem? How can these be applied to the East Bayfront and Port Industrial Area?
- What would a healthy EB/PIA ecosystem be like? From a human perspective? From an ecosystem perspective?
- What is the nature and magnitude of human and ecosystem exposures and what effects can be attributed to them?
- How are different levels of biological organisation affected?
- What is healthy/unhealthy about the ecosystem's current status?
- How can we move towards a healthier ecosystem?

Workgroup: Consultant Kate Davies is undertaking the study, with input from departments of different levels of government and community representatives. Close coordination is being maintained with the other workgroups of the environmental audit, as their research will contribute much of the data base for our understanding of quality of life/health issues.

2. Hazardous Materials

Little is currently known about the storage, transportation, use and/or manufacture of hazardous materials in the study area. Existing information on hazardous wastes and other materials will be compiled during Phase 2 of the Audit to determine the possible risks they represent. The legislative basis for regulation of hazardous materials will be summarised.

Workgroup: Consultant Laura Jones is coordinating this research. Information may be available from Transport Canada, Ontario Ministries of the Environment and Transportation, THC, industries/SETIAO, City of Toronto, and Metro Toronto. Community/environmental groups will also be involved.

3. Assessment of Built Heritage

An understanding of the built heritage of the study area will be important in ensuring that as further changes occur in the area, they are undertaken with respect for the built heritage. The Phase 1 review revealed a good understanding of the historical context and development of the East Bayfront/Port Industrial Area. The next step is a detailed assessment of the built heritage. Such an assessment is currently being undertaken by the Toronto Harbour Commissioners for the Port Industrial District, but not for the East Bayfront.

Research Option: Once published, the THC's assessment of built heritage in the Port Industrial District can be incorporated into the database for Phase 2 of the Environmental Audit. To provide a complete picture of built heritage for the entire Audit study area, an assessment of the built heritage of the East Bayfront could also be undertaken.

Workgroup: A consultant, preferably Jeff Stinson (currently undertaking the THC study).

4. Soils and Groundwater

During Phase 1, information about the current soil and groundwater conditions was gained by reviewing site histories and examining available decommissioning and geotechnical studies. The studies provided information on petroleum refinery and storage sites, a former foundry and a former coal tar distillation plant. No studies were available to the Royal Commission regarding sites used for other activities which might be expected to cause contamination of soils and/or groundwater, such as metal recycling, chemical storage, hydro substations or incinerator ash disposal.

Although the available studies provided a considerable amount of useful information, they are in some cases incomplete. For example, the investigation of the former foundry site provides detailed soil chemistry but nothing on groundwater, whereas the report on a former fuel storage facility contains information on groundwater but no soil chemistry.

Lists of the parameters sampled vary from site to site, ranging from very complete to very limited. They were often chosen on the basis of the Provincial Guidelines for the Decommissioning and Cleanup of Sites in Ontario which do not include specific organic contaminants.

Existing site specific studies demonstrate groundwater contamination with oil and grease, phenols, metals and volatile hydrocarbons. However there is little information on the possible migration of contaminated groundwater to adjacent sites or to surface waters.

There is limited experience with remediation techniques in Ontario. However, Environment Canada is leading a major program at the federal Wastewater Technology Centre to develop and test remediation techniques on the Vancouver waterfront. The results of this program will be applicable to similar industrial sites across the country.

Research Options: To obtain a better understanding of soil and groundwater conditions in the study area, Phase 2 of the Environmental Audit will include:

- A review of additional geotechnical and geochemical information from industries which have already offered to provide studies to the Environmental Audit, as well as other companies which may decide to participate during Phase 2.
- A soil and groundwater testing program on a range of sites.
- A summary of decommissioning and cleanup guidelines used in Ontario and in other jurisdictions.
- A review of possible remediation techniques.

Workgroup: Intera Kenting Consultants, project director Paul Beck; THC; Metro Toronto Public Works Dept., City of Toronto's EPO; industries/SETIAO (?); community/environmental group.

5. Natural Heritage.

Phase 1 of the Environmental Audit yielded excellent information on birds and butterflies, but limited information on other kinds of terrestrial wildlife. Although there is good information on fish species and habitats in Ashbridge's Bay and the Leslie Street Spit, there is no recent information for the Outer Harbour.

Further information on terrestrial and aquatic wildlife in the study area would be useful in (i) exploring ecosystem/food web integrity and health, (ii) identifying specific areas for habitat conservation and (iii) providing an information base for restoration, enhancement and management programs for wildlife and their habitat.

Research Options: Surveys of plants, reptiles, amphibians, fish and small mammals including species inventories and habitat requirements. Investigation of wildlife health and contaminants at different trophic levels. Study of fishing patterns and fish consumption.

Workgroup: Consultant Sarah Kalff is coordinating the natural heritage study and undertaking a survey of bats. Field biologist Gavin Miller is conducting a survey of plants, vegetation types, reptiles and amphibians. Field biologist Ken Fukomoto is undertaking an inventory of small mammals. Contaminant research on small mammals may be undertaken using biomarkers in blood samples and/or tissue analysis.

Research on fish, their habitats and fishing is being undertaken as part of an ongoing MTRCA/MNR waterfront program. Studies of benthic and aquatic communities will be conducted by the Metro Works Department as part of the environmental studies for the Sewage Treatment Plant expansion. Ontario Hydro may have baseline information in relation to the Hearn G.S.

Members of naturalists groups, Friends of the Spit, etc. are also involved.

6. Water and Sediments

There is limited information on water quality in the study area. Because of differences in sampling sites, sampling methods used, and parameters for which analysis was done, it is difficult to accurately assess trends over time. In particular, data on contaminant levels of organic chemicals are poor.

The estimated annual loading of sediments (including contaminants) from the Don River is largely based on models which have not been verified. It is not known, for example, if the recent development boom in York Region has caused significant increases in total loading of contaminants and sediments, or if relative loadings to the Don from particular upstream sources have changed.

Although there are data on bacterial loadings to the Inner Harbour from storm sewers and combined storm sewers overflows, little is known about inputs of metals and organic contaminants from these sources.

Although data exist on the contaminant levels in bottom sediments in the study area, there is no specific information on the toxicity of these sediments to aquatic life.

There are several land use proposals in the study area which may affect water circulation and quality (eg Hearn Generating Station, Port Industrial Park). Upgrading and expansion of the Main Water Pollution Control Plant will also affect water quality in the study area.

Research Options:

- A comprehensive, long-term program of water quality monitoring
- Research on residence times of inner and outer harbour waters on a seasonal basis.
- A program to quantify sediment and contaminant loading from the Don River.
- A program to determine the loadings of metals and organic chemicals to the Inner Harbour from direct outfall of storm sewers and combined storm sewer overflows.
- A program of bioassays conducted on biota from benthic (bottom-dwelling) communities in order to determine the toxicity of bottom sediments to these organisms.
- Investigate potential effects of upcoming projects on water quality and circulation.

Workgroup: Many of the proposed research options may be encompassed by existing programs, eg RAP, MISA, or may be added to such programs relatively easily. Bob Shaw is reviewing these possibilities.

Workgroup on upcoming projects could include City of Toronto Public Works Department, Metro Public Works Department, THC, Ontario Hydro, community/environmental groups.

7. Air

Phase 1 of the environmental audit identified a number of information gaps and options for further research. Some of these will be addressed directly during Phase 2, while for others requiring a longer time period and significant funding, detailed proposals and cost estimates will be prepared. In addition, some of the work being undertaken by RWDI Consultants for the City of Toronto's Ataratiri project is relevant to the EB/PIA and will be incorporated into the environmental audit data base.

Research Options:

- Update the emission inventory and carry out air quality modelling. This is being undertaken by RWDI.
- Conduct a noise survey of the area. This was undertaken in July.
- Carry out research to determine whether sources of odours are using best available technology and management practices. This is being undertaken during August.
- Proposals and cost estimates are being prepared for an upper air station at the Toronto Island Airport, an air monitoring station to be located in the EB/PIA, a mobile lab to survey ambient air quality at various distances from the Gardiner expressway, and a survey of ambient levels of toxics.

Workgroup for Air Studies: Joint federal/provincial team. Consultant Lou Shenfeld is coordinating the study and undertaking specific aspects. Representatives from industries/SETIAO and community/environmental groups.

8. Stewardship and Accountability

The regulatory framework applicable in the EB/PIA is based on a collection of laws, regulations, policies and guidelines pertaining to different aspects of the environment and administered by different levels of government. During Phase 1 of the Environmental Audit we gained a preliminary insight into the complexity, overlapping responsibilities and inadequacies of the regulatory framework.

Conclusions reached in relation to the designated area may also have broader applications, for example to other areas along the waterfront, to other harbours in Canada, to watershed management, and to the Greater Toronto Area.

Research Option: Further research to explore the issues of stewardship and accountability in relation to the environment of the study area. This might investigate such questions as:

- what responsibilities should accompany stewardship of the land?
- how could accountability for environmental protection be clarified and strengthened?
- what are the implications of the current jurisdictional arrangements for waterlots ?
- how could an ecosystem approach be applied to the regulatory framework?
- what changes are needed to make the regulatory framework more effective in terms of the management of human activities in the ecosystem?

Workgroup: Consultants in political science, public administration, and environmental law; government staff/politicians; representatives of community/environmental groups. To be determined after exploratory meeting (in September?).